Khimiya Tverdogo Topliva 1998 N3, pages 397

The formation of complexes of iron(III) with salicylic acid in the presence of cationic and nonionic surfactants

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Abstract

The effect of dodecylpyridinium bromide (DPB) and ethoxylated sorbitan palmitate (Tween 40) on the formation equilibrium of the complex of iron(III) with salicylic acid (H2L) in aqueous solutions was studied at 298 K by the spectrophotometry and NMR-relaxation techniques. It was found that an apparent decrease in the stability of [FeL]+ complex was associated with the solubilization of the ligand in its molecular form within simple and mixed micelles. Based on a mathematical description of the effect of surfactants within the frame-work of the model proposed, the binding constants of salicylic acid with micelles of cationic (logK = 2.0 ± 0.1) and anionic (logK = 2.4 ± 0.1) surfactants were determined. It was concluded that salicylic acid is solubilized in the boundary layer between the hydrocarbon core of micelles and head groups of surfactants.